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Unit 13 - Week 11

Assignment 11

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment. **Due on 2019-04-17, 23:59 IST.**

1) For the first order gas phase decomposition of N_2O_5, the half life periods at 40^0C and 60^0C are respectively 45 min and 6.5 min. Assuming that frequency factor is independent of temperature. Calculate the values of A (Arrhenius factor) and E_a (Activation energy). ***1 point***

- 1.5×10^{-12} min^{-1}, 2.036 kcal mol^{-1}
- 1.5×10^{12} min^{-1}, 2.036 kcal mol^{-1}
- 1.5 min^{-1}, 2.036 kcal mol^{-1}
- 1.5×10^{25} min^{-1}, 1.036 kcal mol^{-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.5×10^{12} min^{-1}, 2.036 kcal mol^{-1}

2) In question 1, find out the time when the total pressure becomes double the initial pressure at 40^0C. ***1 point***

- 71.35 minutes
- 1000 minutes
- 1 minute
- 71.35 seconds

No, the answer is incorrect.
Score: 0

Accepted Answers:
71.35 minutes

3) For a reaction, the energy of activation (E_a) is 25 kcal mol^{-1}. ***1 point***

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.708

4) ***1 point***

No, the answer is incorrect.
Score: 0

Accepted Answers:

5) At 27^0 C, the energy of activation of an uncatalysed reaction is 50 kcal mol^{-1}. By what factor the rate constant of the same reaction is increased when the reaction is catalyzed and the energy of activation is 30 kcal mol^{-1} ***1 point***

- 3.7 times
- 1.5 times
- 2.5 times
- 7.6 times

No, the answer is incorrect.
Score: 0

Accepted Answers:
3.7 times

6) ***1 point***

- Order w.r.t A= 0.5, Order w.r.t B = 1
- Order w.r.t A= 0.5, Order w.r.t B = 2
- Order w.r.t A= 2, Order w.r.t B = 1
- Order w.r.t A= 2, Order w.r.t B = 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
Order w.r.t A= 0.5, Order w.r.t B = 1

7) In question 6, what would be the order of the reaction with respect to A and B if the first two steps are slow and the second step is fast? ***1 point***

- Order w.r.t A= 1, Order w.r.t B =0
- Order w.r.t A= 1, Order w.r.t B =2
- Order w.r.t A= 2, Order w.r.t B =0
- Order w.r.t A= 0, Order w.r.t B =0

No, the answer is incorrect.
Score: 0

Accepted Answers:
Order w.r.t A= 1, Order w.r.t B =0

8) The enzyme-catalysed conversion of a substrate at 25°C has a Michaelis constant of 0.035 mol dm^{-3}. The rate of the reaction is 5.5 × ***1 point***

10^{-3} mol dm^{-3} s^{-1} when the substrate concentration is 0.110 mol dm^{-3}. What is the maximum velocity of this enzymolysis?

- 7.26 x 10^{-3} mol dm^{-3} s^{-1}
- 7.2 x 10^{-30} mol dm^{-3} s^{-1}
- 72 x 10^{-3} mol dm^{-3} s^{-1}
- 7 x 10^{-20} mol dm^{-3} s^{-1}

No, the answer is incorrect.
Score: 0

Accepted Answers:
7.26 x 10^{-3} mol dm^{-3} s^{-1}

9) The volume of oxygen gas at 0°C and 101 kPa adsorbed on the surface of 1.00 g of a sample of silica at 0°C was 0.284 cm^3 at 100 Torr and 1.430 cm^3 at 760 Torr. What is the value of V_{mon}? ***1 point***

- 367.5 cm^3
- 3000 cm^3
- 3.679 cm^3
- 30 cm^3

No, the answer is incorrect.
Score: 0

Accepted Answers:
3.679 cm^3

10) A monolayer of N_2 molecules (effective area 0.55 nm^2) is adsorbed on the surface of 1.00 g of an Fe/Al_2O_3 catalyst at 77 K, the boiling point of liquid nitrogen. Upon warming, the nitrogen occupies 2.86 cm^3 at 0°C and 760 Torr. What is the surface area of the catalyst? ***1 point***

- 52.44 m^2
- 42.29 m^2
- 19.22 m^2
- 30.22 m^2

No, the answer is incorrect.
Score: 0

Accepted Answers:
42.29 m^2

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